REMARKS

I. INTRODUCTION

In response to the Office Action dated May 12, 2005, no claims have been amended. Claims 1-30 remain in the application. Entry of this response, and reconsideration of the application in light of this response, are respectfully requested.

II. NON-ART BASED REJECTIONS

On page 2 of the Office Action, claims 1-30 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicants regard as the invention.

The Applicants respectfully traverse the rejection, however, the Applicants thank the Examiner for providing the dictionary definition of "spacecraft" and accept the Examiner's definition as provided. Applicants believe that this renders the rejection moot, and respectfully request that the rejection be withdrawn.

III. PRIOR ART REJECTIONS

On page (2) of the Office Action, claims 1, 3-6, 8-16, 18-21, and 23-30 were rejected under 35 U.S.C. §102(b) as being anticipated by Duchon, U.S. Patent No. 5,761,031; on page (3) of the Office Action, claims 1-2, 8, 10-13, 16-17, 23 and 25-28 were rejected under 35 U.S.C. §102(b) as being anticipated by Storaasli, U.S. Patent No. 5,597,141; on page (4) of the Office Action, claims 1-2, 6-17, and 21-30 were rejected under 35 U.S.C. §102(b) as being anticipated by Clarke, U.S. Patent No. 3,151,704; and on page (5) of the Office Action, claims 1 and 16 were rejected under 35 U.S.C. §102(b) as being non-patent literature described on Houston Chronicle's Space Chronicle. Applicants respectfully traverse these rejections in light of the arguments below.

The Duchon Reference

The Duchon reference discloses an artificial satellite equipped with aerodynamic orientation rudders. Duchon merely describes an artificial satellite equipped with roll, yaw and pitch rudders (4, 4', 5) to impose on the satellite rotational forces around its three axes due to the resistance of the

rarefied air which surrounds the satellite (compensation for the dynamic inertia of rotating objects onboard the satellite can also be ensured). See Abstract.

The rotation of the rudders 5 and 5', and more specifically the one located in the front of the satellite, produces a dissymetrical obstacle to the flow of rarefied air surrounding the satellite and thus a force around the transverse axis Ys of sufficient intensity at altitudes of some hundreds of kilometers to make the desired pitch corrections rather quickly. The shocks are less than with thrusters and even inertia wheels, so that more gradual, better controlled changes are made. See Col. 3, lines 26-34.

FIGS. 10A and 10B show a third possible embodiment for the pitch rudders 5" which then consist of a sheet-metal strip 50 held like a tent between two rollers 51 adjacent to the central body 1, located parallel to the transverse axis Ys. They rotate around axes 52 near the upper and lower edges of the front or rear side of the central body 1, but torsion springs, not shown, are located between the rollers 51 and the axes 52 to help wind the sheet metal strip 50 around the rollers 51, which a telescopic arm 53 allows when it is folded. The telescopic arm 53 is composed of two lines of rods jointed between them and in their centers in order to draw rhombi. A system that can be composed of an endless screw turning some toothed sectors integral with the rods on the ends of the two lines – like automobile jacks – make the telescopic arm 53 straighten or retract and carry to the opposite end of the central body 1 a yardarm 54 parallel to the rollers 51 which pulls and unwinds the sheet-metal strip 50 when it is moved away from them. See Col. 4, lines 19-36.

The Storaasli Reference

The Storaasli reference discloses a dynamic balance mechanism for balance control of a gyro stabilized (spinning) satellite. An elongated gear rack is attached to the spacecraft. A movable mass is mounted by guide rollers on the gear rack and translates along the gear rack according to requisite electronic commands. The movable mass includes a housing, a stepper motor, a rotary potentiometer, a cable reel, a pair of gear heads and a pinion gear. The pinion gear meshes with the rack and is driven by the stepper motor. The potentiometer measures the position of the movable mass on the gear rack. The cable reel saves space and minimizes harness jamming conditions. The invention secures better weight efficiency. See Abstract.

A flexible wire or cable 64 supplies electrical power to the stepper motor and potentiometer in order to drive the pinion gear. The cable 64 is preferably an 8-wire flexible cable and plugs into a terminal strip or the like on the satellite adjacent one end of the gear rack 30. See Col. 4, lines 23-27.

The Clarke Reference

The Clarke reference discloses a spring motor. The spring motor includes a second spring means for increasing the starting torque and/or the length of run. This spring means may take the form of a power spring of various types, such as a conventional power spiral spring, a torsion spring, or other suitable spring means. See Col. 2, lines 32-37.

The Houston Chronicle Reference

The Houston Chronicle reference discloses a solid-state recorder. The new solid-state recorder is about the same size as the reel-to-reel it replaces.

The Claims are Patentable Over the Cited References

Independent claims 1, 16, and 19 are generally directed to an apparatus for trimming the mass properties of a spacecraft. An apparatus in accordance with the present invention comprises a storage spool mounted on the spacecraft, an output spool mounted on the spacecraft, and a flexible material having a first end coupled to the storage spool and a second end coupled to the output spool, wherein a length of the flexible material is distributed between windings of the storage spool and the output spool to adjust mass properties of the spacecraft.

None of the cited references teach nor suggest these various elements of Applicants' independent claims. Specifically, neither of the cited references teaches or suggests at least the element where a length of the flexible material is distributed to adjust mass properties of the spacecraft as recited in the claims of the present invention.

As stated in the application as filed, on page 6, paragraph [0023], "Controlling the distribution of flexible material 210 between the windings of the storage spool 204 and the output spool 206 adjusts the center of gravity position 212 as the mass of the flexible material 210 is transferred between the spools 204, 206." None of the cited references teach or suggest this feature.

In the Duchon reference, the sheet-metal strip 50 is deployed to provide an obstacle to the flow of rarefied air surrounding the satellite. The sheet metal strip 50 is used as a rudder. The sheet-metal strip is not distributed to adjust the mass properties; it is deployed or distributed to provide air resistance.

In the Storaasli reference, the cable 64 provides power to the stepper motor, but since the stepper motor moves with the movable mass mechanism 14, the cable 64 must be deployed and retracted with the stepper motor. The cable is not distributed to adjust the mass properties of the spacecraft; the cable is unwound to provide power to the movable mass mechanism 14.

In the Clarke reference, even if the case 10 were attached to a spacecraft, the flexible material 24 is not distributed to adjust the mass properties; it is distributed to keep the motor running and initially used to increase the motor's starting torque.

In the Houston Chronicle reference, the tape in the reel-to-reel tape recorder is not distributed to adjust the mass properties, it is moved from one reel to another to record data generated by the spacecraft science and telemetry subassemblies.

As argued in the previous response, Clarke and Houston Chronicle do not discuss mass properties. The Clarke reference is directed toward a motor having a high starting torque in a specific direction. See Col. 1, lines 28-33. The Houston Chronicle reference discusses data recording on a reel-to-reel tape.

If the Examiner is relying on inherency, such inherency "may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." *Continental Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1269(Fed. Cir. 1991). Instead, to establish inherency, the extrinsic evidence "must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill." *Continental Can Co.*, 948 F.2d at 1268.

In finding anticipation by inherency, the Office Action ignored the foregoing critical principles. The Office Action has not shown that the distributing of a length of the flexible material between windings of the storage spool and the output spool to adjust mass properties is necessarily present in the references of record.

The Clarke and Houston Chronicle references do not discuss mass properties at all. Thus, regardless of whether the motor of Clarke or the tape recorder of Houston Chronicle are mounted on a spacecraft, they cannot as a matter of law teach or suggest changing the mass properties by distributing a flexible material between a storage spool and an output spool.

The Duchon reference does not discuss mass properties; instead, Duchon creates a rudder to asymmetrically change the air resistance of the spacecraft.

The Storaasli reference uses the cable 64 to electrically power a motor. Storaasli does not discuss changing the mass properties by distributing the cable 64; Storaasli uses the cable 64 to provide power.

The various elements of Applicants' claimed invention together provide operational advantages over the systems disclosed in the cited references. In addition, Applicants' invention solves problems not recognized by the cited references.

Thus, Applicants submit that independent claims 1, 16, and 19 are allowable over the cited references. Further, dependent claims 2-15, 17-18, and 20-30 are submitted to be allowable over the cited references in the same manner, because they are dependent on independent claims 1, 16, and 19, respectively, and because they contain all the limitations of the independent claims. In addition, dependent claims 2-15, 17-18, and 20-30 recite additional novel elements not shown by the cited references.

IV. CONCLUSION

In view of the above, it is submitted that this application is now in good order for allowance and such allowance is respectfully solicited. Should the Examiner believe minor matters still remain that can be resolved in a telephone interview, the Examiner is urged to call Applicants' undersigned attorney.

Respectfully submitted,

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